



Toolkit:

The relationship between product efficiency and price

Session 5

Kevin Lane, IEA – Paris, 21 May 2019



#energyefficientworld

Overview of the appliance and equipment training sessions

Tuesday 21 May		
0	Introduction and roundtable	<input checked="" type="checkbox"/>
1	Planning energy efficiency programmes	<input checked="" type="checkbox"/>
2	Selecting products for MEPS and Labelling programmes	<input checked="" type="checkbox"/>
3	Assessing efficiency performance and setting MEPS	<input checked="" type="checkbox"/>
4	Industry transformation	<input checked="" type="checkbox"/>
5	The relationship between product efficiency and price	<input type="checkbox"/>
Wednesday 22 May		
6	Stakeholder involvement and communication	<input type="checkbox"/>
7	Insights into energy labels	<input type="checkbox"/>
	Site Visit.	<input type="checkbox"/>
Thursday 23 May		
8	Modernising energy efficiency through digitalisation	<input type="checkbox"/>
9	Monitoring, verification and enforcement	<input type="checkbox"/>
10	Monitoring and evaluating policies and programmes	<input type="checkbox"/>
11	Roundtable discussion, review and report back	<input type="checkbox"/>

You have been asked to prepare an impact statement for your regulations, including the effect on product prices.

How would you go about the task of estimating future product prices?



Why are appliance costs/prices important?

- A core aim of energy efficiency programs is to deliver cost benefits to consumers
- In principle, any **additional costs** of more efficient equipment is offset by lifetime **savings in fuel bills**
- Consumer Life-cycle cost = Capital cost + lifetime running costs
- Often used to set performance thresholds, i.e. via least life-cycle costs

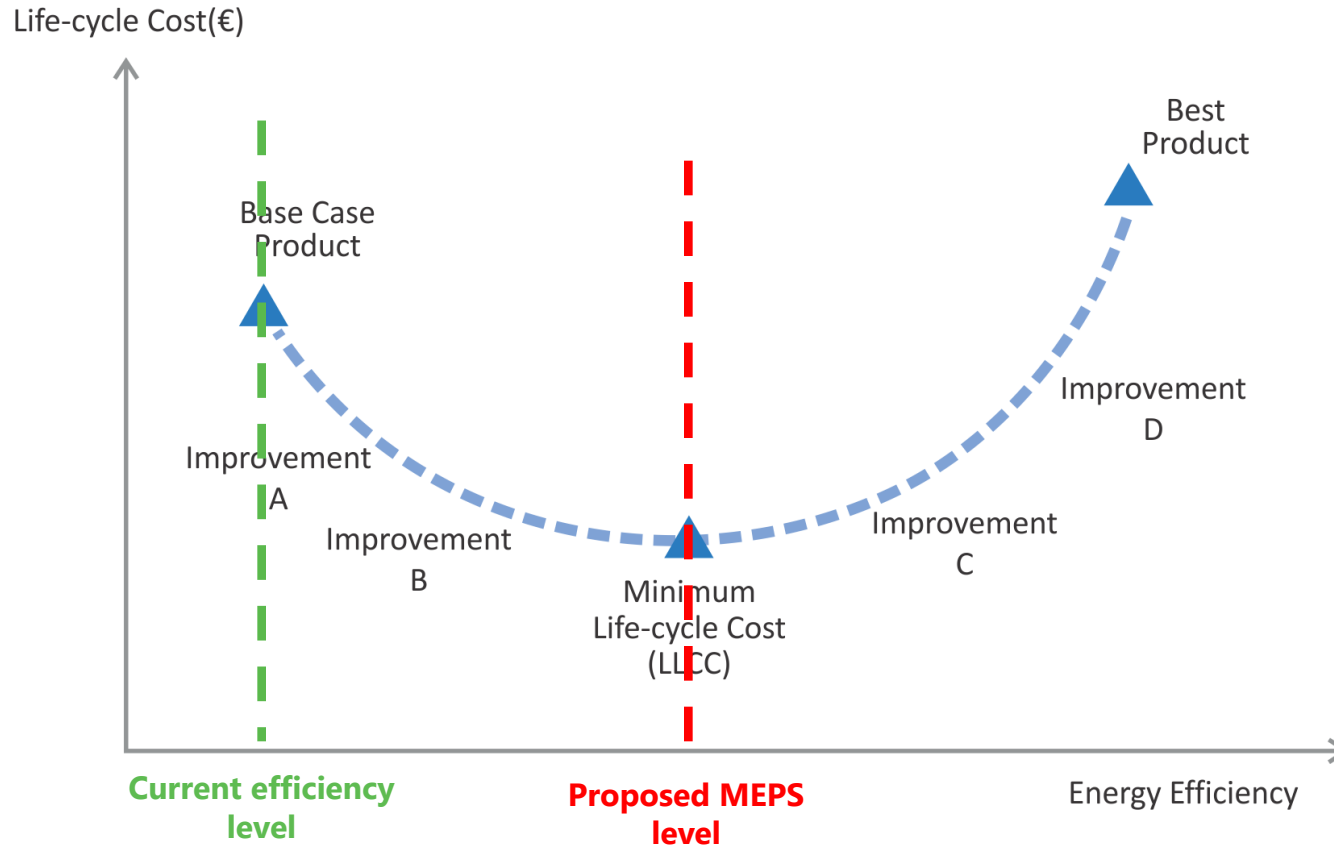


Consumer life-cycle costs



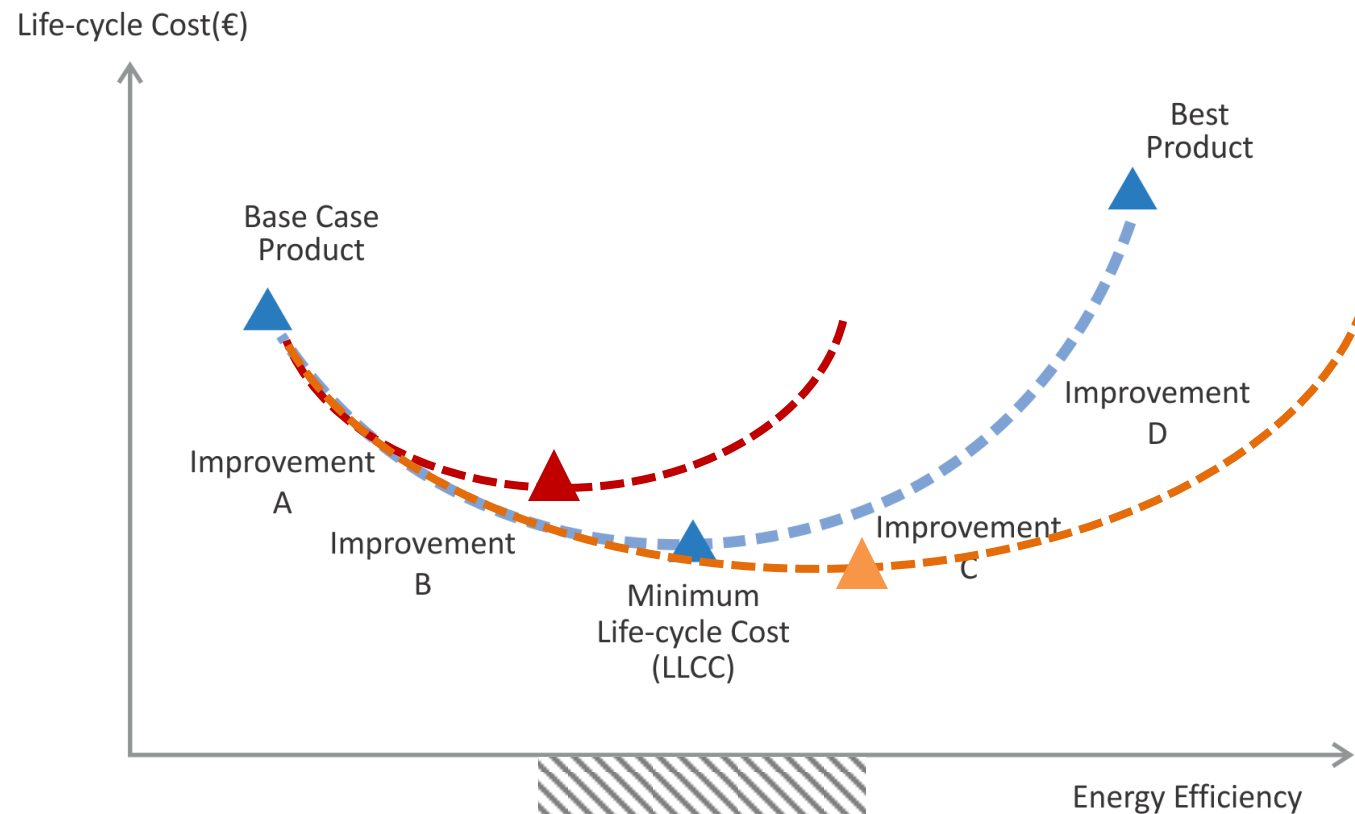
	Average product	Energy efficient product
Capital Cost (\$)	\$300	\$350
Running cost per annum	$= 150\text{kWh} \times 0.2\$$ $= \$30$	$= 120\text{kWh} \times 0.2\$$ $= \$24$
Lifetime (years)	12	12
Total lifetime cost (LC)	$= 300 + (30 \times 12)$	$= 350 + (24 \times 12)$
LC	\$660	\$638

Setting MEPS at Least Life-cycle cost



- If you are setting MEPS based on least life-cycle cost....
- What impact is there if efficient products costs are higher/lower?

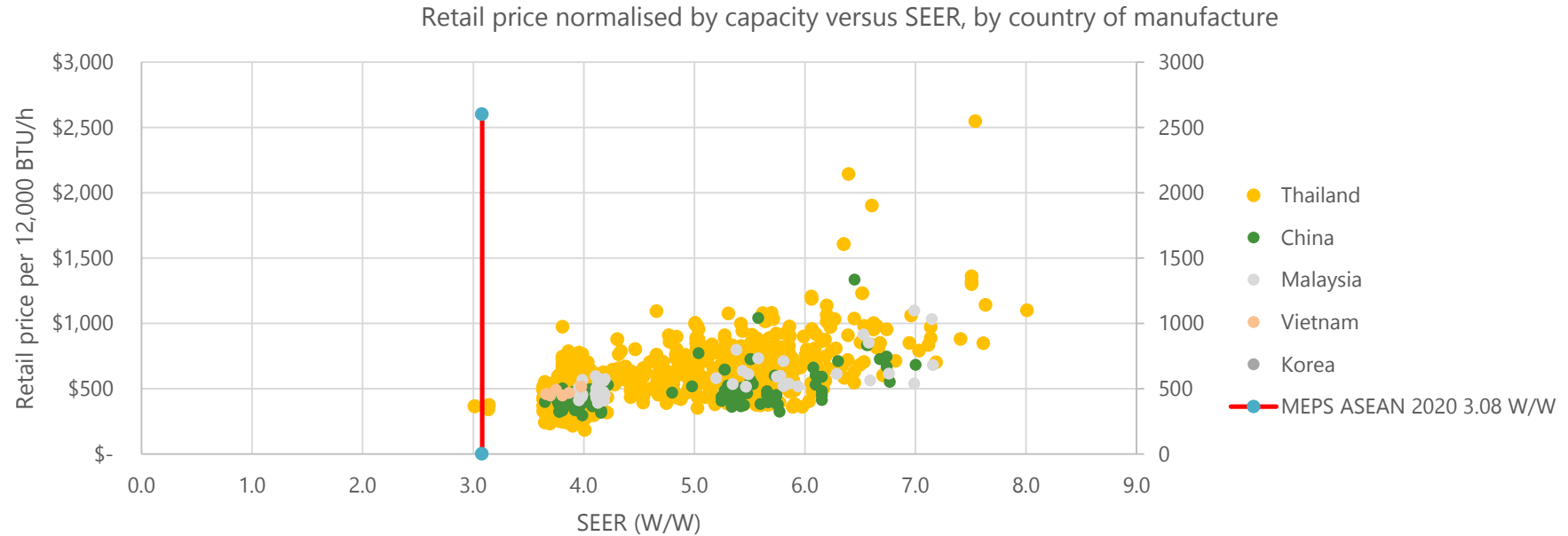
Setting MEPS at Least Life-cycle cost



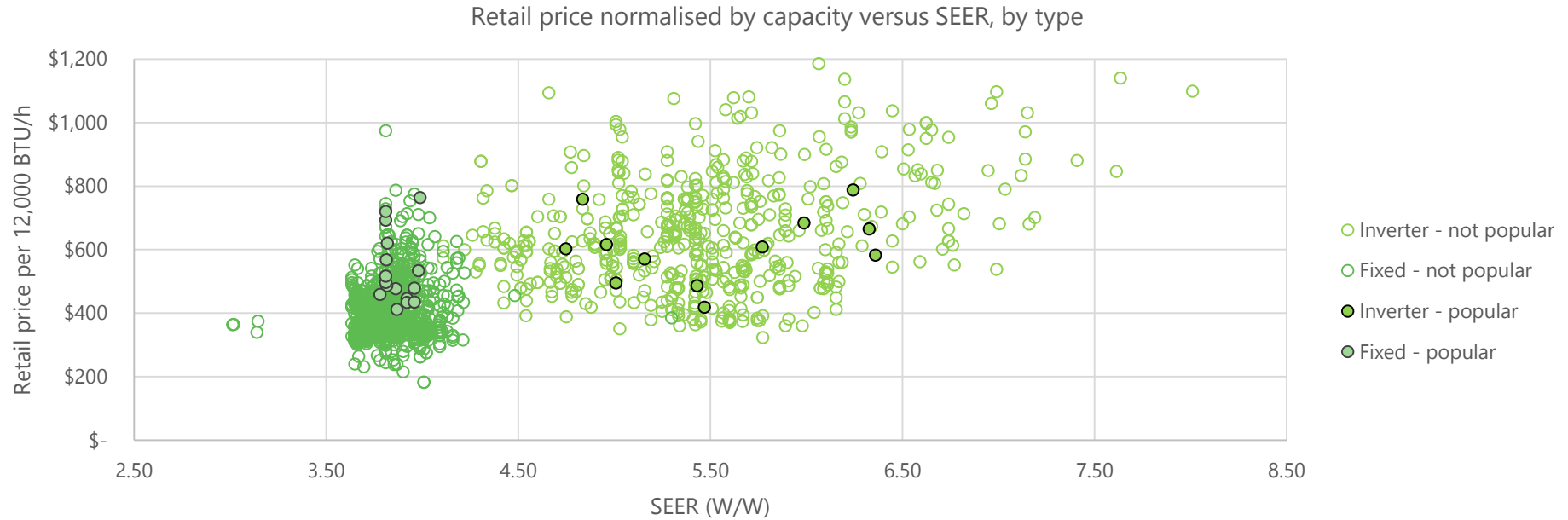
What is actually happening to product prices?

- So that is the theory
- Now lets look at what is actually happening.....

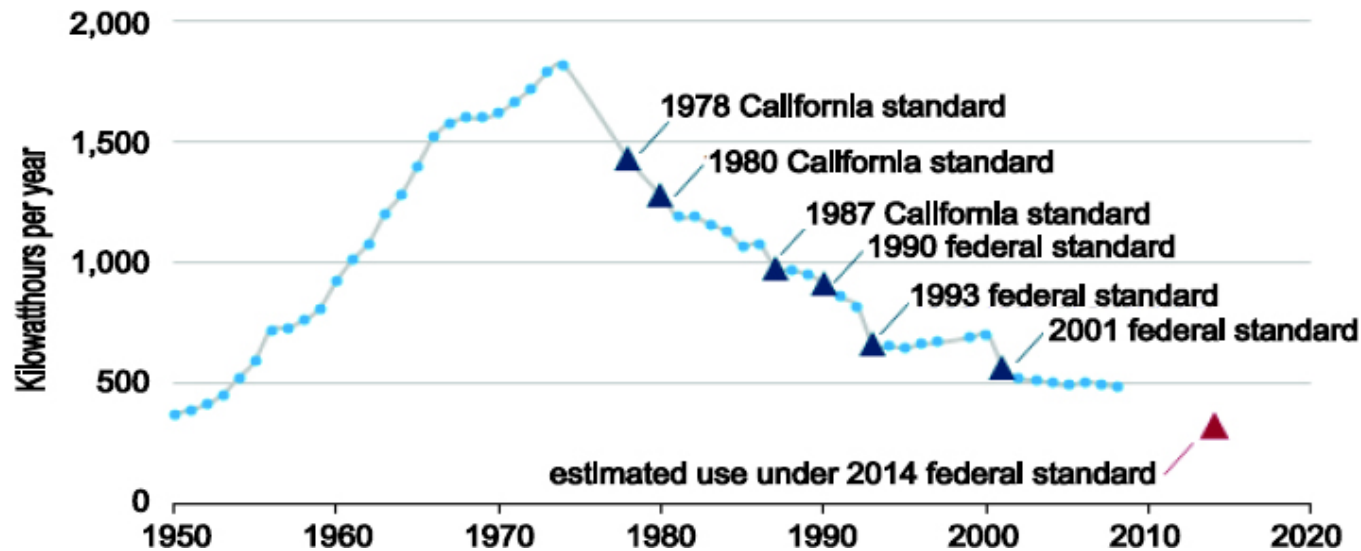
Thailand – Retail price vs capacity (and country manufacture)



Thailand - Retail price vs capacity (and technology)



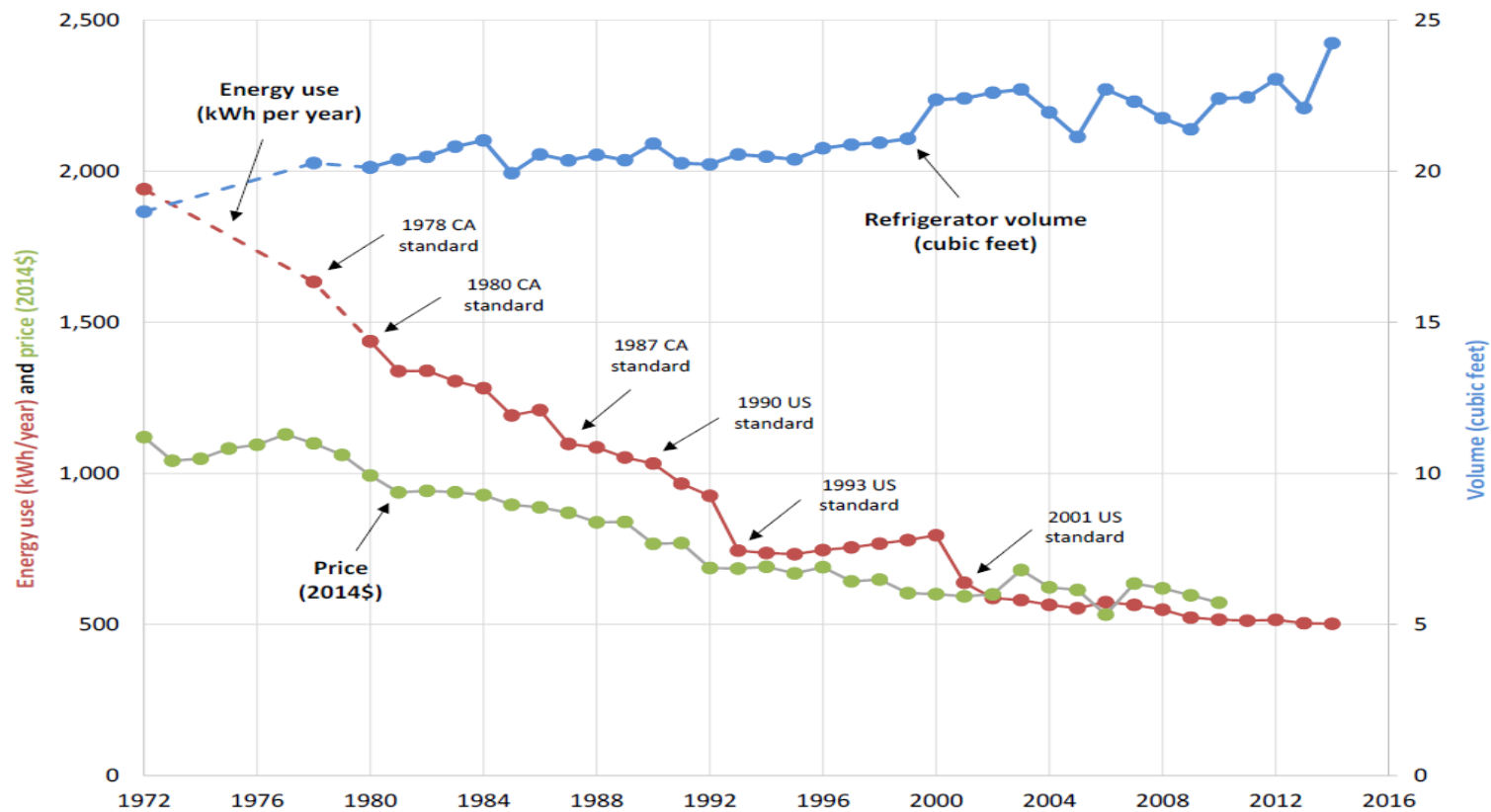
Analysis: Impact of Refrigerator Standards: Energy Consumption in the USA



Ratcheting MEPS have has reduce energy consumption of new US refrigerators by 75%

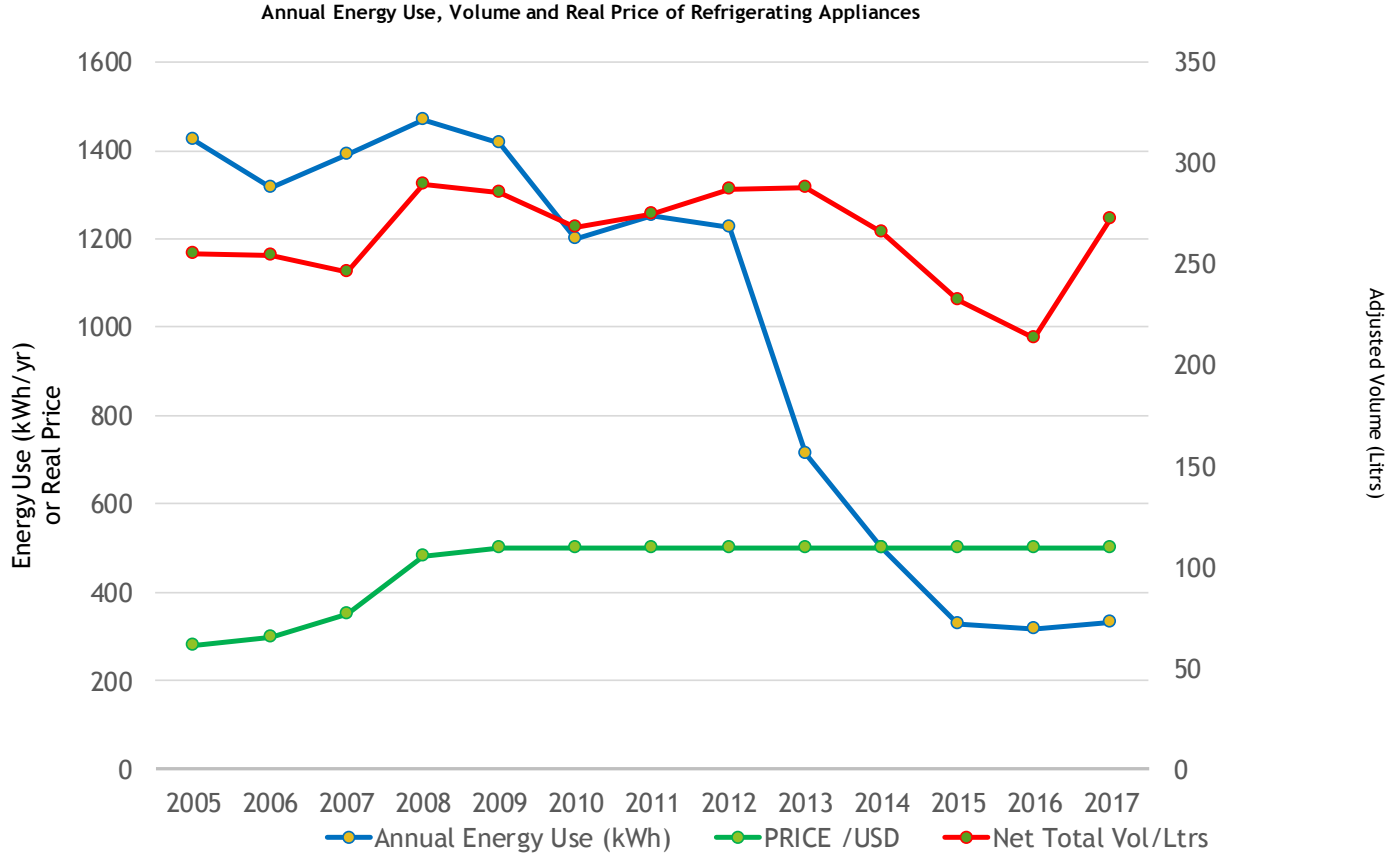
Source: EIA, 2013

Analysis: Impact of Refrigerator Standards: Energy Consumption in the USA

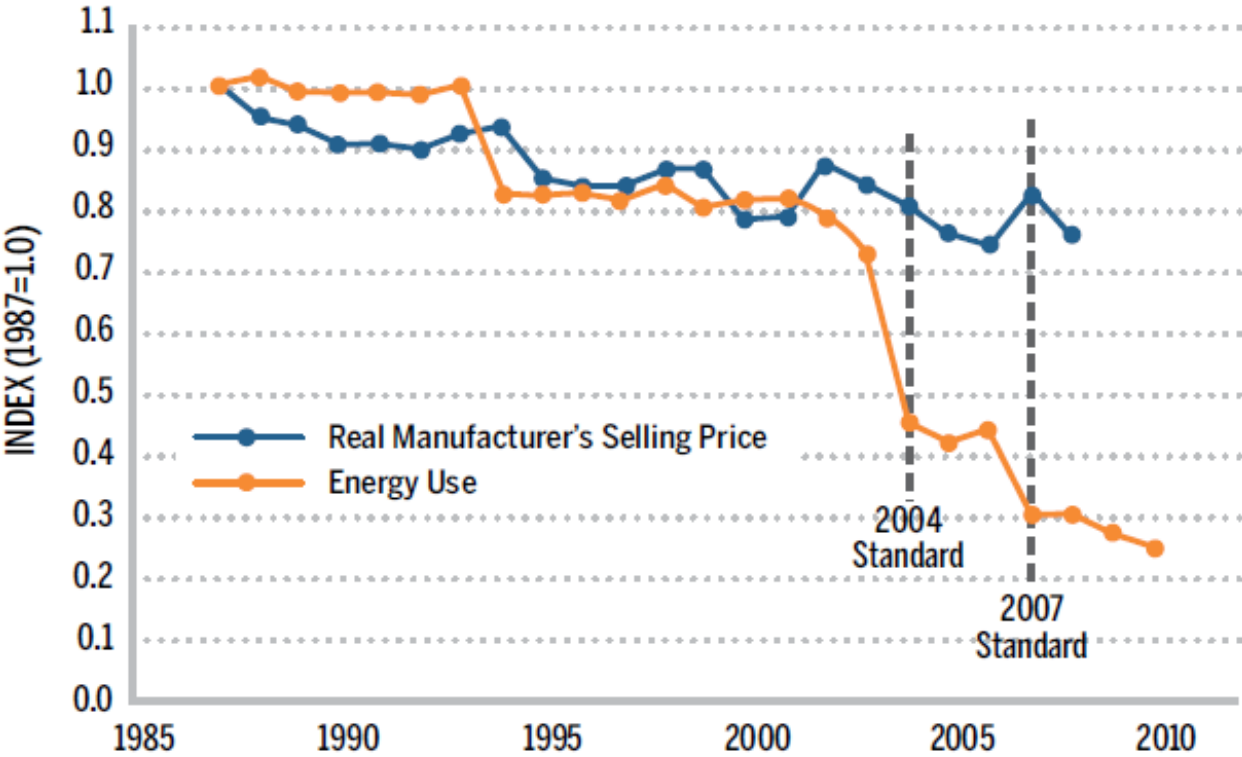


ACEEE, 2017. Energy-Saving States of America: How Every State Benefits from National Appliance Standards

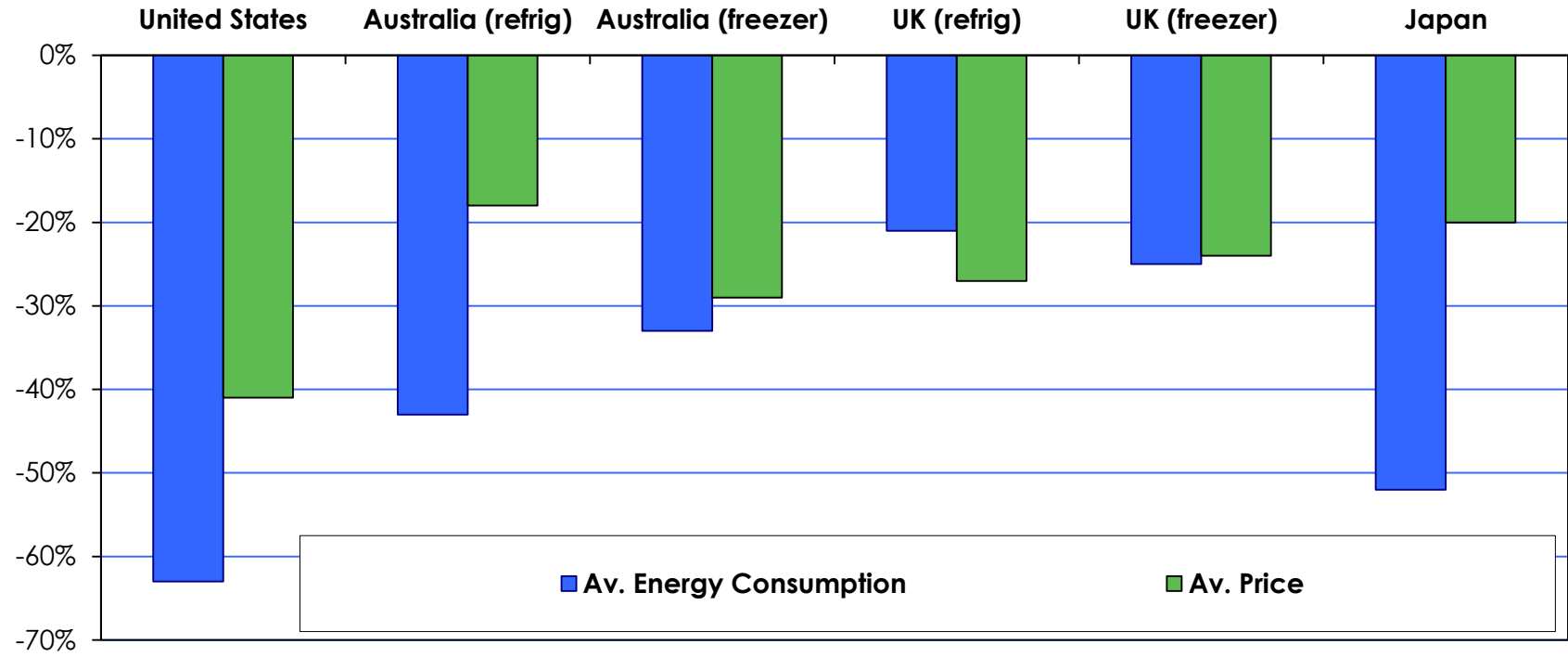
Analysis: Impact of refrigerators standards in Ghana



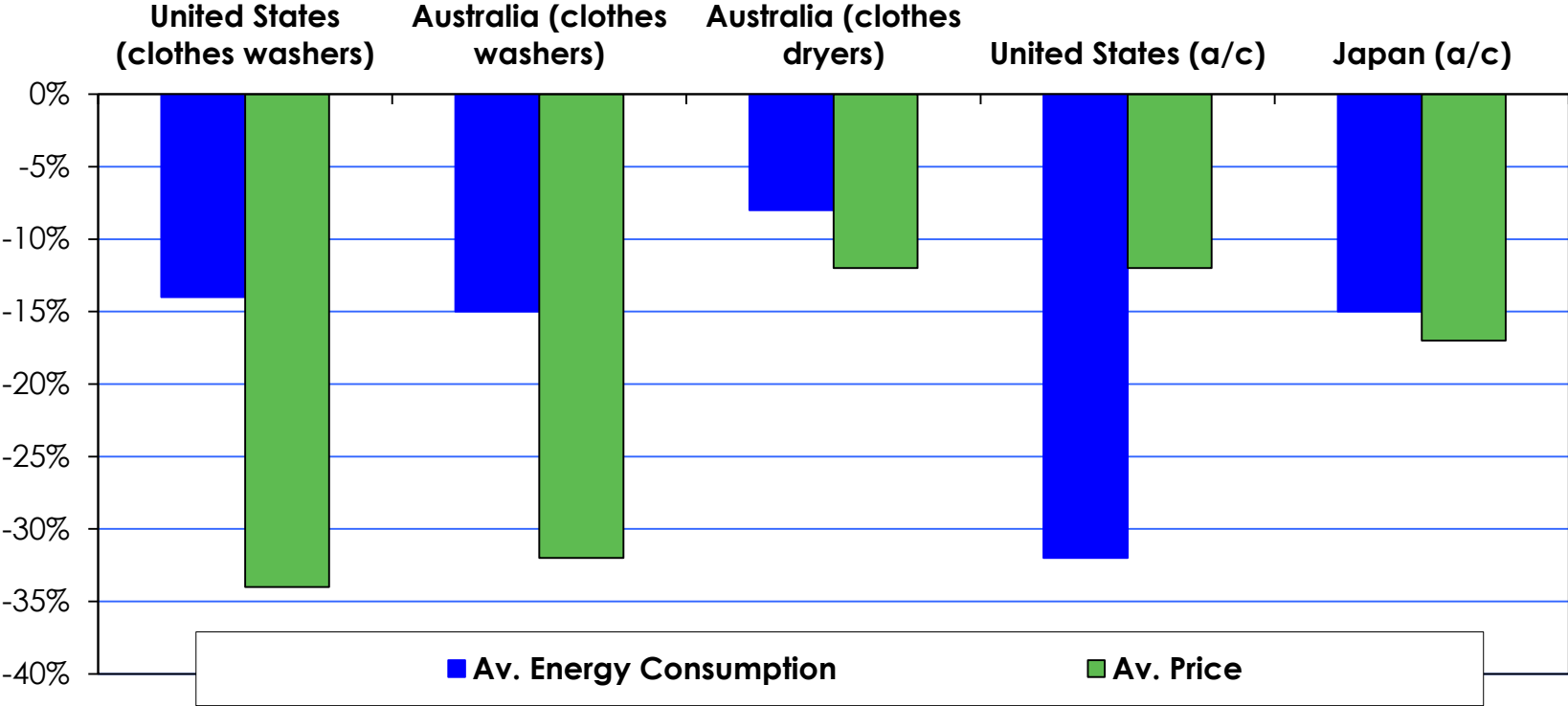
Source: Kofi Agyarko, IEA EE Global 2018



Examination of MEPS impacts: Cold appliances: % change



Examination of MEPS impacts: other appliances: % change



- No evidence that Standards and Labeling policies have increased real prices to consumers
 - Some minor movements, usually explained by other factors
- Generally average real prices for studied products have fallen *faster* than for other goods in these markets
- No correlation with energy/electricity prices
 - increasing energy price is a less effective policy, and has inequity issues
- Manufacturers confirm that, given notice, energy efficiency requirements can be absorbed into design process with little or *no extra cost*

- No correlation between product price and efficiency
- However, sometimes the most efficient products are also the most expensive, because:
- High priced products differentiate through:
 - branding
 - quality of materials
 - design
 - energy efficiency is a further indicator of quality

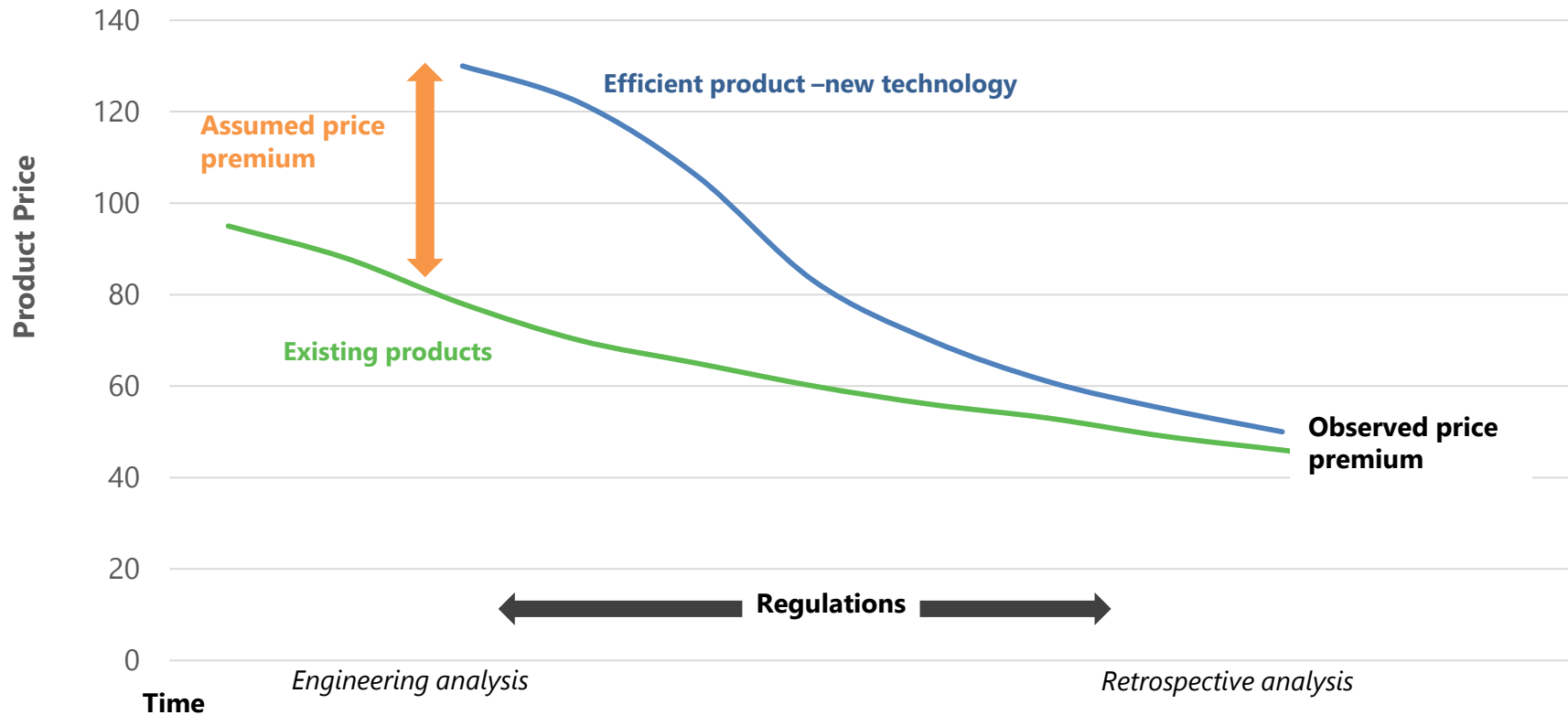
- So how does this impact on our policy settings?

What happened? (increase in purchase cost, expected, actual)

Appliance Type	DOE estimate price BEFORE	Census prices AFTER
Refrigerators	56	37
Clothes washers	54	-35
Clothes washers	199	10
Electric water heaters	108	28
Non-electric water heaters	121	34
Central ac	267	207
Room ac	13	-162
Commercial ac	512	-224
Ballasts	6.73	-1.78
Average	148	-12
Median	108	10

- Predictions made prior to regulations based on engineering analysis
- Observed prices may be 5-10 years later
- In the meantime:
 - Regulations stimulate growth in the market
 - Costs have reduced as the market share has grown
 - Some shift to offshore manufacturing
 - Companies find innovative solutions
 - *Technologies rarely predicted*

Price changes over time



- Current cost-benefit analysis tends to overstate the future costs of efficient appliances
 - Politically conservative
- Observations fit '*learning-by-doing*' model
- Suggests that we have not been optimising policies to reduce energy and CO₂
- Policies could be more stringent and still show positive benefits
- Some countries now reduce estimates for future cost impacts

- www.iea.org/efficiency
- www.iea-4E.org



www.iea.org



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